

SURVEY OF MISSISSIPPI CATFISH FARMERS ON MEANS, EFFORT, AND  
COSTS TO REPEL FISH-EATING BIRDS FROM PONDS

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## ABSTRACT

Eighty-seven percent of 281 Mississippi catfish farmers felt that fish-eating birds were enough of a problem to warrant harassment. Farmers estimated that they spent an average of 2.6 man-hours per day harassing birds at an average annual cost of \$7400. Sixty percent of the farmers who harassed birds did so by driving around the ponds and firing at birds to repel them. Propane exploders and pyrotechnics were also used. Pyrotechnics were judged the most effective repellent technique. The cost of bird harassment according to these farmers is \$2.1 million. The value of fish loss to cormorants alone is roughly estimated at \$3.3 million. The total annual loss to birds is estimated at \$5.4 million.

## INTRODUCTION

Commercial catfish farming started in the 1950's in Kansas and Arkansas. By 1965 when the first commercial catfish pond was established in Mississippi, Arkansas had over 7,000 acres of commercial catfish ponds, and Louisiana and Texas all had acreage. But Mississippi quickly became the leader in the new enterprise with over 85,000 acres by 1985 (Wellborn 1987). At the present time the

Mississippi Delta region alone has over 88,000 acres of commercial catfish ponds (Mississippi Cooperative Extension Service 1989).

Activities of fish-eating birds have long been a concern at fish-rearing facilities because their feeding sometimes results in serious economic losses (Mott 1978). In most cases, this concern has been directed at great blue herons (Ardea herodias), great egrets (Casmerodius albus), and other wading birds at hatcheries and rearing stations (Lagler 1939). Great blue herons and great egrets are indigenous to the Mississippi Delta. Great blues are found there year round whereas great egrets traditionally winter primarily in Mexico, Central and South America with remnants wintering along the Gulf coast (Palmer 1962). Undoubtedly the large increase in catfish pond acreage has allowed heron and egret numbers to increase in the Delta.

Except for a small subspecies nesting in Florida, the North American populations of the double-crested cormorant (Phalacrocorax auritus) breed in Canada and the Great Lakes region in the U.S. Traditionally, their numbers had been held in check by fishermen who raided their colonies, and by organochloride pesticides used after World War II. However, in the 1970's and 1980's, coincidental with the growth

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in numbers of catfish ponds in Mississippi, the numbers of double-crested cormorants in the Great Lakes region and in Canada began to increase. Pesticide levels had subsided and cormorant rookeries were receiving greater protection from fisherman depredations (Vermeer and Rankin 1984). Prior to this time the great majority of cormorants from the Great Lakes and central Canadian regions migrated down the Mississippi River to winter along the shores of the Gulf of Mexico (Lewis 1929). But with the increase in commercial catfish complexes in the Delta area of Mississippi, more and more cormorants began stopping off there rather than continuing on to the Gulf. Birdwatcher reports in the journal American Birds (volumes 25 through 41; 1970-1987) documented the gradual buildup in the numbers of overwintering cormorants from 1970 on. In 1987 we found a roost containing 17,000 cormorants in the Delta, and in early 1988 we estimated that cormorant populations in the Delta may have peaked at nearly 50,000.

As a result of increased depredations by cormorants in addition to that by great blue herons and great egrets, funding was made available to establish a new USDA/APHIS Science and Technology research station at Mississippi State University at Starkville, Mississippi in August 1988. One of the first projects of the new station was a survey of Mississippi catfish farmers regarding methods used to repel fish-

eating birds from their ponds and their perceptions of the effectiveness and costs of harassment.

We wish to express appreciation to the 281 farmers who cooperated in making this survey possible, and to the Mississippi Cooperative Extension Service for providing the farmer names and telephone numbers. We also want to thank Don Mott and Lana Hodnett for making many of the phone calls. Don Mott also reviewed the manuscript.

#### METHODS

The Mississippi Cooperative Extension Service provided the names, addresses, and telephone numbers of all Mississippi catfish farmers on their list. We sent out an introductory letter explaining the reasons for the survey. The letter included a tear-off sheet that farmers could return if they did not wish to participate in the survey.

Those farmers who did not return the tear-off sheets were contacted by telephone and questioned (Appendix I) about the impact of fish-eating birds on their farm enterprises. The questions involved estimates of bird numbers seen on their farms, the measures they used to keep birds off their ponds, the effectiveness of these methods, the number of man-hours spent chasing birds, and the cost of these efforts including not only labor but also equipment and supplies relating to bird harassment such as ammunition, gasoline, scare devices, etc. The phone calls were made between mid-

October and mid-December 1988.

#### RESULTS

Of the 314 farmers initially contacted by letter, we received responses from 281 farmers, or 89 percent of these initial number. These 281 farmers represented 308 farming complexes, and of these 281, 219 (78%) were located on 244 complexes in the Delta. Average statewide farm size approximated 270 acres (range 2 acres to 3,040), so these farmers represented approximately 84,000 acres of catfish ponds in the State of which 80,500 were in the Delta.

Of the 281 farmers queried, 244 (87%) felt they had a bird problem and had to harass. (Of the 13% who did not have bird problems, 62% were located outside the Delta.) Of those who had to harass, 147 (60%) said they drove around their ponds, shooting to repel. Only 13% of the 147 thought this technique to be "very effective", 47% considered it to be "somewhat effective", and 40% considered the technique "not effective".

Of 97 farmers who used propane exploders (cannons), 9% considered them to be "very effective", 51% "somewhat effective", and 40% "not effective". The consensus was that cannons were most efficient when used in combination with other harassment techniques.

Pyrotechnics (rocket cartridges, shellcrackers, and bird bombs) were regularly used by 21 farmers. Of this group, 24% considered them to be "very effective", 57% "somewhat effective", and 19%

"not effective". Six farmers used loudspeakers and distress calls. Two considered these technique to be "somewhat effective" and the remaining four "not effective".

Among the remaining farmers who used other techniques, one reported that the use of an all-terrain vehicle was "very effective" in allowing ponds to be reached under adverse weather conditions. Another, who parked a vehicle in the vicinity of his ponds and placed a human effigy beside it, considered this method to be "very effective".

The farmers who said they harassed birds estimated that they spent an average of 2.6 man-hours per day year-round chasing birds at an estimated cost of \$7.80 per hour. This cost the average farmer in the survey \$20.25 per day or \$7400 per year. Based on these figures, the total annual cost for bird control efforts for all 281 farmers was roughly \$2.1 million. This figure does not include the cost of the fish taken by the birds.

Moderate to heavy cormorant activity (at least 25 cormorants per day) was reported by 57% of Delta farmers compared with only 14% of non-Delta farmers. The average cost per day for harassment statewide was \$26.00. This translates into approximately \$4700 per farmer for the 6-month period that cormorants are present in Mississippi.

#### DISCUSSION

An estimate of the monetary impact of cormorants alone on the loss of fish can be made by assuming a relatively

conservative 35,000 double-crested cormorants present in the Delta from November through April last year. Based on a conservative estimate of 0.67 lb of fish eaten daily by an individual cormorant (Schramm et al. 1984) at the market price at that time of \$.78 per pound, almost \$3.3 million worth of catfish were estimated to be consumed by cormorants last winter. (However, this does not take into account that the cormorant diet includes an undetermined percentage of trash fish.) This estimate, in combination with the estimated \$2.1 million farmers spent in trying to ward off fish-eating birds, means that catfish farmers may have lost \$5.4 million last winter, not including catfish losses to wading birds. The \$5.4 million loss amounts to almost \$20,000 for each of the 281 farmers. Mississippi catfish farmers had total sales of \$210 million in 1938. Assuming that the 281 farmers received their proportionate share of sales amounting to \$188 million losses to birds approximated 3% of total sales.

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APPENDIX I. Catfish Farmer Questionnaire

- 1) Name \_\_\_\_\_
- 2) Address \_\_\_\_\_  
\_\_\_\_\_
- 3) Phone number \_\_\_\_\_
- 4) Locations of Ponds (Distance from nearest town and compass direction) \_\_\_\_\_
- 5) How many ponds and how many acres do you have? \_\_\_\_\_  
\_\_\_\_\_
- 6) What is the maximum number of cormorants you have seen on your ponds at any one time? \_\_\_\_\_
- 7) What is the average number of cormorants you see on your ponds in the cormorant season from October to May? \_\_\_\_\_
- 8) What is the maximum number of great blue herons you seen on ponds at any one time? \_\_\_\_\_
- 9) What is the average number of great blues you see on your ponds year-round? \_\_\_\_\_
- 10) What is the maximum number of great egrets you have seen? \_\_\_\_\_
- 11) What is the average number of great egrets you see on your pond in the spring, summer, and fall? \_\_\_\_\_
- 12) What protective measures do you use?  
List: 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_
- 13) Effectiveness of protective measures: Very, somewhat, or not.  
List: 1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_
- 14) Average number of man-hours per day spent chasing birds year-round \_\_\_\_\_
- 15) Approximate cost of manpower per day spent chasing birds year-round \_\_\_\_\_